



09/647,734

5-26-05

ab c.

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Dated: May 24, 2005

Signature: Judy Daley  
(Judy Daley)

Docket No.: 55156(70904)  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Letters Patent of:  
Hiroyuki Katayama

Patent No.: 6,882,617

Issued: April 19, 2005

For: MAGNETIC RECORDING MEDIUM AND  
METHOD OF RECORDING

**Certificate**  
**MAY 31 2005**  
**of Correction**

**REQUEST FOR CERTIFICATE OF CORRECTION**  
**PURSUANT TO 37 CFR 1.322**

MS Post Issue  
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P.O. Box 1450  
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Dear Sir:

Upon reviewing the above-identified patent, the Patentee has noted a typographical error that should be corrected.

At page 1: PCT Filed: Please change the date from "Apr. 4, 1999" to – Apr. 2, 1999 --, as indicated in red on the original Filing Receipt dated 10/26/2000 (copy enclosed).

The error was not in the application as filed by the Patentee (see enclosed copy of Declaration and Power of Attorney and copy of cover page of published International (PCT) application as originally filed with filing date circled in red). Accordingly, the Patentee respectfully submits that no fee is required.

Transmitted herewith is a proposed Certificate of Correction that if entered will effect the correct amendment of the above-identified United States Patent. Patentee respectfully solicits the granting of this request for the issuance of a Certificate of Correction.

Finally, the Patentee as noted above believes that additional fees are not required in connection with the consideration of the foregoing Request for a Certificate of Correction of the above-identified United States Patent. However, if for any reason a fee is required, a fee paid is inadequate or a credit is owed for any excess fee paid, you are hereby authorized and requested to charge and/or credit Deposit Account No. **04-1105**, as necessary, for the correct payment of all fees which may be due in connection with the filing and consideration of this communication.

Dated: May 24, 2005

Respectfully submitted,

By David A. Tucker

David A. Tucker

Registration No.: 27,840

EDWARDS & ANGELL, LLP

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Attorneys/Agents For Applicant

**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**

PATENT NO. : 6,882,617  
DATED : April 19, 2005  
INVENTOR(S) : Hiroyuki Katayama

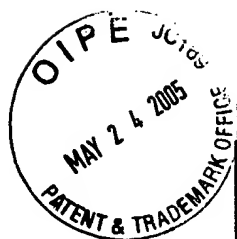
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

At page 1: PCT Filed: Please change the date to April 2, 1999.

MAILING ADDRESS OF SENDER:  
David A. Tucker  
EDWARDS & ANGELL, LLP  
P.O. Box 55874  
Boston, Massachusetts 02205

PATENT NO. 6,882,617

No. of additional copies 2



Application No. (if known): 09/647,734

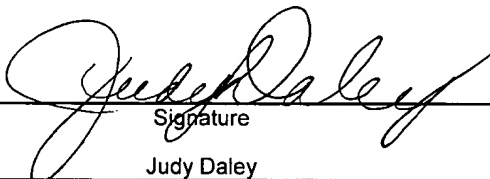
Attorney Docket No.: 55156(70904)

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Certificate of Correction (1 page)  
Request for Certificate of Correction (No Fee) (2 pages)  
Copy of Filing Receipt (3 pages, PCT data circled in red)  
Copy of Declaration as filed (4 pages, PCT filing date circled in red)  
Copy of cover page of International Publication of corresponding  
PCT application (1 page, filing date circled in red)  
Copy of Page 1 of U.S. Patent No. 6,882,617 B1 with marked  
correction (1 page)

JUN 2 2005



US006882617B1

(12) **United States Patent**  
**Katayama**

(10) **Patent No.:** **US 6,882,617 B1**  
(45) **Date of Patent:** **Apr. 19, 2005**

(54) **MAGNETIC RECORDING MEDIUM AND METHOD OF RECORDING**

5,109,312 A \* 4/1992 Kato et al. .... 505/171

# FOREIGN PATENT DOCUMENTS

(75) **Inventor:** **Hiroyuki Katayama, Nara (JP)**

EP 0 471 527 B1 2/1992

(73) **Assignee:** **Sharp Kabushiki Kaisha, Osaka (JP)**

JP 50-151035 12/1975

(\*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

JP 57189356 A 11/1982

JP 01119901 A 5/1989

JP 01-258204 10/1989

JP 03130904 A 6/1991

JP 04255864 A 9/1992

JP 04302836 A 10/1992

WO 92/02931 2/1992

(21) **Appl. No.:** **09/647,734**

(22) **PCT Filed:** **Apr. 4, 1999** **Apr. 2, 1999**

\* cited by examiner

(86) **PCT No.:** **PCT/JP99/01783**

*Primary Examiner*—Ali Neyzari

§ 371 (c)(1),

(2), (4) **Date:** **Oct. 4, 2000**

(74) *Attorney, Agent, or Firm*—David G. Conlin; David A. Tucker; Edwards & Angell, LLP

(87) **PCT Pub. No.:** **WO99/52101**

# (57) ABSTRACT

**PCT Pub. Date:** **Oct. 14, 1999**

(30) **Foreign Application Priority Data**

Apr. 6, 1998 (JP) ..... 10-92127

(51) **Int. Cl.<sup>7</sup>** ..... **G11B 7/26**

(52) **U.S. Cl.** ..... **369/288; 369/275.1; 369/13.07; 428/694 ML**

(58) **Field of Search** ..... **369/275.1, 275.2, 369/275.3, 275.4, 13.07, 288, 283, 13.42, 13.41, 13.4, 286; 360/126, 125, 106; 505/171; 428/64.3, 694 ML, 694 SC, 694 XS, 694 RE**

In a method of recording and reproduction using a magnetic storage medium, a magnetic storage medium (5) is used in which at least magnetic recording film (2) and a superconducting film (3) are deposited. According to the method,

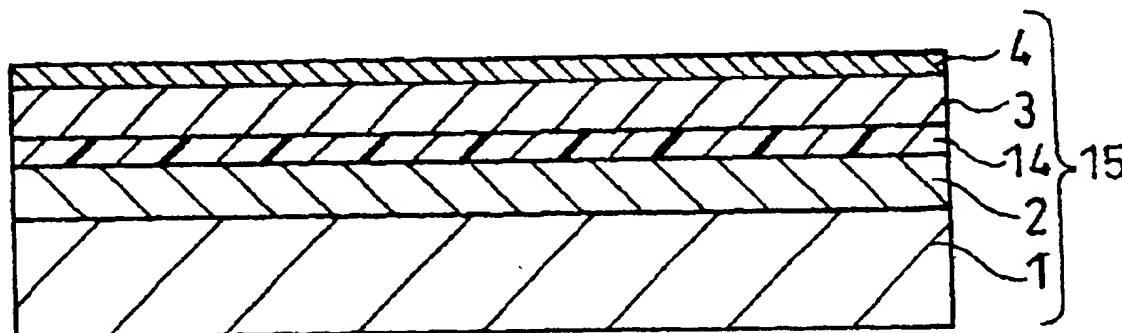
the superconducting layer (3) is partly heated where data is either recorded in recording or reproduced in reproduction, using a semiconductor laser (6) to or beyond its critical temperature at which diamagnetism disappears. Thus, in recording, data can be recorded with high density without affecting adjacent parts of the magnetic recording layer regardless of the physical size of the magnetic head. In reproduction, data can be reproduced from a minuscule part at high S/N ratios with crosstalk from adjacent bits being substantially eliminated.

(56) **References Cited**

# U.S. PATENT DOCUMENTS

4,996,621 A \* 2/1991 Ruigrok et al. .... 360/126

**9 Claims, 4 Drawing Sheets**



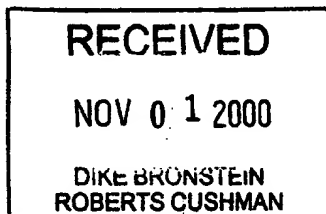


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| APPLICATION NUMBER | FILING DATE | GRP ART UNIT | FIL FEE REC'D | ATTY. DOCKET NO | DRAWINGS | TOT CLAIMS | IND CLAIMS |
|--------------------|-------------|--------------|---------------|-----------------|----------|------------|------------|
| 09/647,734         | 10/04/2000  | 2652         | 860           | 55156-(904)     | 4        | 10         | 2          |

Dike Bronstein Roberts & Cushman  
130 Water Street  
Boston, MA 02109



## FILING RECEIPT



Date Mailed: 10/26/2000

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the PTO processes the reply to the Notice, the PTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).**

## Applicant(s)

Hiroyuki Katayama, Nara-shi, JAPAN;

## Continuing Data as Claimed by Applicant

THIS APPLICATION IS A 371 OF PCT/JP99/01783 04/02/1999

## Foreign Applications

If Required, Foreign Filing License Granted 10/26/2000

## Title

Magnetic recording medium and method of recording

## Preliminary Class

360

Data entry by : ORDENEZ, MARTA

Team : OIPE

Date: 10/26/2000



JUN 2 2005



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[illegible]



- 2 -

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| Application Serial No.   | U.S. Filing Date | Patented                 | Pending | Abandoned |
|  |                  |                          |         |           |
|  |                  |                          |         |           |
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| PCT Applications Designating the U.S.  |                  |                          |         |           |
| Application No.  | Filing Date      | U.S. Serial No. Assigned |         |           |
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| Applicant | Provisional Application Number | Filing Date |
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**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) with full powers of association, substitution and revocation to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

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David G. Conlin (Reg. No. 27,026)  
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Linda M. Buckley (Reg. No. 31,003)  
Ronald I. Eisenstein (Reg. No. 30,628)  
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Peter J. Manus (Reg. No. 26,766)

David S. Resnick (Reg. No. 34,235)  
Peter F. Corless (Reg. No. 33,860)

|  |   |
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|--|---|

|             |                         |  |  |  |
|-------------|-------------------------|--|--|--|
| 2<br>0<br>1 | FULL NAME OF INVENTOR   | LAST NAME<br>Katayama                          | FIRST NAME<br>Hiroyuki                 | MIDDLE NAME  |
|             | RESIDENCE & CITIZENSHIP | CITY<br>Nara-shi                               | STATE OR FOREIGN COUNTRY<br>Nara Japan | COUNTRY OF CITIZENSHIP<br>Japan                      |
|             | POST OFFICE ADDRESS     | POST OFFICE ADDRESS<br>1-17-34-510, Tomio-Kita | CITY<br>Nara-shi                       | STATE OR COUNTRY AND ZIP CODE<br>Nara 631-0076 Japan |

|             |                         |                     |                          |                               |
|-------------|-------------------------|---------------------|--------------------------|-------------------------------|
| 2<br>0<br>2 | FULL NAME OF INVENTOR   | LAST NAME           | FIRST NAME               | MIDDLE NAME                   |
|             | RESIDENCE & CITIZENSHIP | CITY                | STATE OR FOREIGN COUNTRY | COUNTRY OF CITIZENSHIP        |
|             | POST OFFICE ADDRESS     | POST OFFICE ADDRESS | CITY                     | STATE OR COUNTRY AND ZIP CODE |

|             |                         |                     |                          |                               |
|-------------|-------------------------|---------------------|--------------------------|-------------------------------|
| 2<br>0<br>3 | FULL NAME OF INVENTOR   | LAST NAME           | FIRST NAME               | MIDDLE NAME                   |
|             | RESIDENCE & CITIZENSHIP | CITY                | STATE OR FOREIGN COUNTRY | COUNTRY OF CITIZENSHIP        |
|             | POST OFFICE ADDRESS     | POST OFFICE ADDRESS | CITY                     | STATE OR COUNTRY AND ZIP CODE |

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|-------------|-------------------------|---------------------|--------------------------|-------------------------------|
| 2<br>0<br>4 | FULL NAME OF INVENTOR   | LAST NAME           | FIRST NAME               | MIDDLE NAME                   |
|             | RESIDENCE & CITIZENSHIP | CITY                | STATE OR FOREIGN COUNTRY | COUNTRY OF CITIZENSHIP        |
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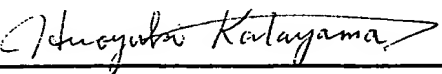
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| 2<br>0<br>5 | FULL NAME OF INVENTOR   | LAST NAME           | FIRST NAME               | MIDDLE NAME                   |
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|-------------|-------------------------|---------------------|--------------------------|-------------------------------|
| 2<br>0<br>6 | FULL NAME OF INVENTOR   | LAST NAME           | FIRST NAME               | MIDDLE NAME                   |
|             | RESIDENCE & CITIZENSHIP | CITY                | STATE OR FOREIGN COUNTRY | COUNTRY OF CITIZENSHIP        |
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| 2<br>0<br>7 | FULL NAME OF INVENTOR   | LAST NAME           | FIRST NAME               | MIDDLE NAME                   |
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|             | POST OFFICE ADDRESS     | POST OFFICE ADDRESS | CITY                     | STATE OR COUNTRY AND ZIP CODE |

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| 2<br>0<br>8 | FULL NAME OF INVENTOR   | LAST NAME           | FIRST NAME               | MIDDLE NAME                   |
|             | RESIDENCE & CITIZENSHIP | CITY                | STATE OR FOREIGN COUNTRY | COUNTRY OF CITIZENSHIP        |
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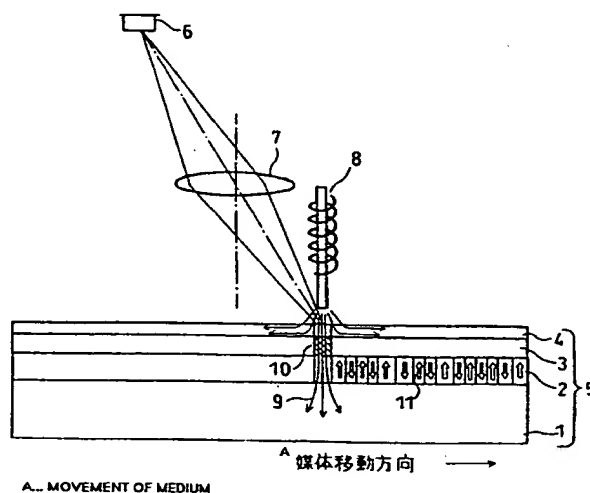
|  |                           |
|--|---------------------------|
| Signature of Inventor 201<br> | Signature of Inventor 202 |
| Date: August 28, 2000  | Date:                     |



|   |  |   |
|---|--|---|
| (51) 国際特許分類<br><b>G11B 5/66, 5/02, H01F 10/26, 10/16, 10/12</b>   | <b>A1</b>  | (11) 国際公開番号<br><b>WO99/52101</b><br><br>(43) 国際公開日<br>1999年10月14日(14.10.99) |
| (21) 国際出願番号<br>PCT/JP99/01783<br><br>(22) 国際出願日<br>1999年4月2日(02.04.99)<br><br>(30) 優先権データ<br>特願平10/92127 1998年4月6日(06.04.98) JP<br><br>(71) 出願人 (米国を除くすべての指定国について)<br>シャープ株式会社(SHARP KABUSHIKI KAISHA)[JP/JP]<br>〒545-8522 大阪府大阪市阿倍野区長池町22-22 Osaka, (JP)<br>(72) 発明者 ; および<br>(75) 発明者 / 出願人 (米国についてのみ)<br>・片山博之(KATAYAMA, Hiroyuki)[JP/JP]<br>〒631-0076 奈良県奈良市富雄北1-17-34-510 Nara, (JP)<br>(74) 代理人<br>弁理士 原 謙三(HARA, Kenzo)<br>〒530-0041 大阪府大阪市北区天神橋2丁目北2番6号<br>大和南森町ビル 原謙三国際特許事務所 Osaka, (JP) | (81) 指定国 KR, SG, US, 欧州特許 (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE)<br><br>添付公開書類<br>国際調査報告書<br>補正書 |   |

(54) Title: MAGNETIC RECORDING MEDIUM AND METHOD OF RECORDING

(54) 発明の名称 磁気記録媒体およびその記録再生方法



(57) Abstract

A recording and reproducing method of the magnetic recording medium uses a magnetic recording medium (5) that includes a laminate of a magnetic recording film (2) and a superconducting film (3). A semiconductor laser (6) is used to increase the temperature of the superconducting film (3) at recording parts during recording and at reproducing parts during reproduction above the critical temperature at which diamagnetism disappears. This achieves high-density recording independently of the size of the magnetic head and without affecting adjacent areas in the magnetic recording layer. Moreover, information is reproduced from even minute areas with improved S/N by substantially restricting a crosstalk from adjacent bits.